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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/506,396	09/01/2004	Robert Campbell	200608 (8830-293)	1422

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EXAMINER	
JACOB, MARY C	
ART UNIT	**PAPER NUMBER**
2123	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	12/22/2006	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/506,396	CAMPBELL, ROBERT	
	Examiner	Art Unit	
	Mary C. Jacob	2123	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *01 September 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *25-48* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *25-48* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *01 September 2004* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *9/1/04*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. Claims 25-48 have been presented for examination.

2. The Preliminary Amendments, filed 9/1/04, have been considered.

Drawings

3. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference character(s) not mentioned in the description: 2a, 2c, B, W, P, h. Corrected drawing sheets in compliance with 37 CFR 1.121(d), or amendment to the specification to add the reference character(s) in the description in compliance with 37 CFR 1.121(b) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

4. The disclosure is objected to because of the following informalities. Appropriate correction is required.

5. Page 3, line 10, "tructure" should read, "structure".

6. Page 3, line 17, "Integrity" should read, "integrity".

Claim Objections

7. Claim 40 objected to because of the following informalities: line 1, "area" should be written, "are". Appropriate correction is required.

Claim Rejections - 35 USC § 112

8. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

9. Claims 25-46 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

10. Claim 25 rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential steps, such omission amounting to a gap between the steps. See MPEP § 2172.01. The omitted steps are: the use of the "initial dimensions of the structure". Step i of the claim recites "collecting data relating to the initial dimension of the structure" and step ii recites "creating a computer model of the structure", however, it is unclear whether the data of the initial dimensions of the structure is used to create the computer model of the structure as it appears to not be used anywhere in the claim. Further, it becomes unclear what is "updated" in step vi of the claim. Are the "initial dimensions" updated with the "measured" dimensions of step v?

11. Claim 25 recites the limitation "the integrity" in line 1. There is insufficient antecedent basis for this limitation in the claim.

12. Claim 25 recites the limitation "the initial dimensions" in line 2. There is insufficient antecedent basis for this limitation in the claim.

13. Claim 25 recites the limitation "the estimated load" in line 4. There is insufficient antecedent basis for this limitation in the claim.

14. Claim 25 recites the limitation "the dimensions of the structure in high stress areas" in line 7. There is insufficient antecedent basis for this limitation in the claim.

15. Claim 27 recites the limitation "the results" in line 2. There is insufficient antecedent basis for this limitation in the claim. Further, step vii is directed to calculating "a value", therefore, it appears that "the results" should be directed to singular "result".

16. Claim 28 recites the limitation "the actual load" in line 3. There is insufficient antecedent basis for this limitation in the claim.

17. Claim 32 recites the limitation "a second set of sensors", however, there is no recitation of a "first set of sensors" in claim 25. It is unclear whether this claim was intended to depend on claim 31.

18. Claim 35 recites the limitation "the minimum size defects" in line 2. There is insufficient antecedent basis for this limitation in the claim.

19. Claim 36 recites the limitation "the precision of the measurement equipment" in line 2. There is insufficient antecedent basis for "the precision" and "the measurement equipment" in the claim.

20. Claim 37 recites the limitation "the load history" in line 2. There is insufficient antecedent basis for this limitation in the claim.

21. Claim 38 recites the limitation "the integrity" in line 1. There is insufficient antecedent basis for this limitation in the claim.

22. Claim 38 recites the limitation "the dimensions" in line 2. There is insufficient antecedent basis for this limitation in the claim.

23. Claim 38 recites the limitation "the load" in line 3. There is insufficient antecedent basis for this limitation in the claim.

24. Claim 39 recites the limitation "the result" in line 2. There is insufficient antecedent basis for this limitation in the claim.

25. Claim 46 recites the following: "Structure, such as a plant, provided with a processing arrangement according to claim 38", it is unclear what the meaning of this limitation is. How can a structure be provided with a processing arrangement?

Claim Rejections - 35 USC § 101

26. 35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

27. Claims 25, 26, 31-37-38, 40-48 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

28. Claim 25 recites steps to access the integrity of a structure and using a computer model, calculates a value for the integrity of the structure. However, this "value" is not a concrete, useful or tangible result since it is not applied to a "real world" application. For

example, this "value" is not stored or displayed anywhere for use by a designer in the assessing of the structure.

29. Claim 38 recites a processing arrangement that calculates a value representing the integrity of a structure. However, this "value" is not a concrete, useful or tangible result since it is not applied to a "real world" application. For example, this "value" is not stored or displayed anywhere for use by a designer in the assessing of the structure.

Claim Rejections - 35 USC § 103

30. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

31. Claims 25-40, 42-48 are rejected under 35 U.S.C. 103(a) as being unpatentable over Scott et al (US Patent 4,480,480) in view of Palusamy et al (EP Patent Application Number 0358994).

32. As to Claims 25 and 38, Scott et al teaches: a method for assessing the integrity of a structure, comprising the steps of: placing the initial characteristics of a structure that it is new and unfatigued in memory, and processing means including algorithms to calculate values for these same characteristics from measured data and then compare the initial and values from actual values obtained from measured data, thereby creating a computer model for a structure (column 11, line 66-column 12, line 1; Figure 4), using data relating to an estimated load the structure is designed for (column 10, line 20) and

data obtained from real-time measurements of the actual load on the aircraft (column 10, lines 14-23; column 14, lines 35-46) to continuously monitor the differences between the real-time measured data and the initial data caused by changing physical dimensions in the structure in the computer to continuously re-analyze the structure calculate values for the integrity of the structure (column 2, lines 13-37; column 5, lines 64-68; column 11, lines 61-column 12, line 7) by accessing the remaining fatigue lifetime of an airframe, warning of impending failure of the airframe due to loads which approach or exceed the designed loads, warning of impending engine failure and directly measuring the compliance of structural members subjected to known loads (column 10, lines 12-23), defining areas which are subjected to high stress (column 21, lines 31-38, lines 68); wherein the processing arrangement is provided with sensors to measure data and transmit the data in real-time and receiving means to analyze the data and update the calculations regarding integrity of the structure (Figure 4 and description; column 10, lines 9-23).

33. Scott et al does not expressly teach measuring the dimensions of an area in high stress areas and updating the computer model using the results of measuring the dimensions of the structure in high stress areas.

34. Palusamy et al (EP Patent Application Number 0358994) teaches a method to enable the management of massive amounts of data collected during corrosion-erosion monitoring of piping systems that allows for the automatic evaluation of inspection data to produce an assessment of the containment integrity of a component of a pipe system (column 1, lines 34-49), wherein potential weak points in the piping system are located

(column 2, lines 34-36), and data relating to a component's location, pipe size and structure among other data are input to the system (column 2, line 52-column 3, line 3), determining where the wall thickness of the components will be measured (column 3, lines 12-39), inspecting the components and acquiring inspection data (column 3, lines 50-53), evaluating the pipe wall integrity through the calculation of stress on a component and on present pipe size and structure of the component (column 4, line 52-column 5, line 6), and providing two dimensional and three dimensional plots to show a graphical representation of corrosion-erosion within a component (column 5, lines 50-55).

35. Scott et al and Palusamy et al are analogous art since they are both directed to the real-time monitoring of the structural integrity of a component in a system.

36. It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the collection of data relating to the load and stress on a structure and calculating a value of structural integrity based on this data as taught in Scott et al to further include the measurement of dimensions of a structure as taught in Palusamy et al since Palusamy et al teaches a method to enable the management of massive amounts of data collected during corrosion-erosion monitoring of a system such as a piping systems that allows for the automatic evaluation of inspection data to produce an assessment of the containment integrity of components in a system such as a pipe system (column 1, lines 34-49).

37. As to Claim 26, Scott et al in view of Palusamy et al teach: wherein the method comprises the step of: viii) repeating one or more times steps v), vi) and vii) (Scott et al: column 10, lines 9-23).

38. As to Claims 27 and 39, Scott et al in view of Palusamy et al teach: ix) visualizing the results of step vii) (Scott et al: column 6, lines 44-52; column 10, lines 52-62).

39. As to Claim 28, Scott et al in view of Palusamy et al teach: x) measuring the actual load on the structure, xi) updating the data relating to the load on the structure, and thereafter xii) re-analysing the structure, using the computer model and the updated load data, in order to calculate a value for the integrity of the structure (Scott et al: column 10, lines 9-23; column 14, lines 13-46).

40. As to Claim 29, Scott et al in view of Palusamy et al teach: xiii) repeating one or more times steps x), xi) and xii) (Scott et al: column 10, lines 9-23; column 14, lines 13-46).

41. As to Claim 30, Scott et al in view of Palusamy et al teach: the step of: xiv) visualizing the results of step xii) (Scott et al: column 6, lines 44-52; column 10, lines 52-62).

42. As to Claim 31, Scott et al in view of Palusamy et al teach: wherein the method comprises the step of installing, after step iv), in high stress areas, a set of sensors for measuring the dimensions of the structure in said high stress areas (Palusamy et al: column 2, lines 34-42; column 3, lines 12-25).

43. As to Claim 32, Scott et al in view of Palusamy et al teach: installing sensors for measuring the load on the structure in said high stress areas (Scott et al: column 16, line 21; column 17, lines 30-32; column 21, lines 50-52).

44. As to Claim 33 Scott et al in view of Palusamy et al teach: connecting the sensors to a processing means, such as a computer, for transmitting data from the sensors to the processing means in real time (Scott et al: Figure 4; column 6, lines 20-39; column 10, lines 9-14).

45. As to Claim 34, Scott et al in view of Palusamy et al teach: wherein the method comprises the step of prior to step iv), collecting data relating to known defects of the structure and thereafter using said defect data, the computer model of the structure and the load data for defining areas which are subject to relatively high loads (Scott et al: column 10, lines 56-58; column 11, line 66-column 12, line 30; column 13, lines 10-17; Palusamy et al: column 2, lines 34-42).

46. As to Claim 35, Scott et al in view of Palusamy et al teach: wherein the method comprises the step of prior to step iv), estimating the minimum size of defects in the structure and thereafter using said estimated defect data, the computer model of the structure and the load data for defining areas which are subject to relatively high loads (Scott et al: column 11, line 66-column 12, line 7; column 13, lines 10-17; column 21, lines 50-68; Palusamy et al: column 2, line 52-column 3, line 5; column 4, lines 42-column 5, line 13; column 6, lines 42-44).

47. As to Claim 36, Scott et al in view of Palusamy et al teach: wherein the minimum size of the defects is estimated to be equal to the precision of the measurement

equipment, used for measuring the dimensions of the structure (Palusamy et al: column 4, lines 34-51; column 6, lines 42-44).

48. As to Claim 37, Scott et al in view of Palusamy et al teach: wherein the method comprises the step of prior to step iv), collecting data relating to the load history on the structure and thereafter using said load history, the computer model of the structure and the load data for defining areas which are subject to relatively high loads (Scott et al: column 9, lines 35-55; column 19, lines 4-8; Palusamy et al: column 5, lines 14-30).

49. As to Claim 40, Scott et al in view of Palusamy et al teach: wherein the sensors area adapted to measure pressure exerted on the structure (Scott et al: column 6, lines 65-68; column 8, lines 3-16).

50. As to Claim 42, Scott et al in view of Palusamy et al teach: wherein the sensors are adapted to measure mechanical loading on the structure (Scott et al: column 7, lines 12-14; column 14, lines 13-39).

51. As to Claim 43, Scott et al in view of Palusamy et al teach: wherein the sensors are adapted to measure fluid loading on the structure (Scott et al: column 19, lines 4-8, 44-46; column 20, lines 19-27, wherein sensors measure wave loading on an offshore platform structure and the loading on an ocean going vessel wherein it is understood that the loading on the vessel would include the weight on the structure and the pressure exerted on the structure from the surrounding water; Palusamy et al: column 4, line 52-column 5, line 1, wherein the sensor measurements are used to measure the stress due to fluid loading on the piping component).

52. As to Claim 44, Scott et al in view of Palusamy et al teach: wherein the sensors are adapted to measure vibration (Scott et al: column 9, lines 35-39; column 13, line 19-column 14, line 12).

53. As to Claim 45, Scott et al in view of Palusamy et al teach: wherein the sensors are adapted to measure acceleration experienced by the structure (Scott et al: column 6, lines 65-68; column 7, lines 57-68).

54. As to Claim 46, Scott et al in view of Palusamy et al teach: a structure, such as a plant, provided with a processing arrangement according to claim 38 (Palusamy et al: column 1, lines 1-5; column 2, lines 18-30).

55. As to Claims 47 and 48, Scott et al in view of Palusamy et al teach: A computer program product comprising data and instructions that after being loaded by a processing arrangement provides said arrangement with the capacity to carry out a method according to claim 25, a data carrier provided with a computer program product according to claim 47 (Scott et al: Figure 4, column 6, lines 13-56; Palusamy et al: Figure 1).

56. Claim 41 is rejected under 35 U.S.C. 103(a) as being unpatentable over Scott et al in view of Palusamy et al as applied to claim 38 above, and further in view of Zachary et al (US Patent 5,867,977).

57. Scott et al in view of Palusamy et al teach sensors for measuring pressures and loadings on a structure for an assessment of the structural integrity of a structure.

58. Scott et al in view of Palusamy et al do not expressly teach the sensors measured to measure temperature.

59. Zachary et al teaches a method for preserving the structural integrity of a gas turbine through a system that monitors the temperature of a working fluid with at least one temperature sensor (Abstract; column 20, lines 50-58).

60. Scott et al in view of Palusamy et al and Zachary et al are analogous art since they are all directed to the assessment of the structural integrity of a system.

61. It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the measurement of pressures and loadings on a structure as taught by Scott et al in view of Palusamy et al to further include sensors to measure temperature as taught in Zachary et al since Zachary et al shows that it is known in the art that temperature could be measured with sensors for the assessment and preservation of the structural integrity of a system (Abstract; column 20, lines 50-58).

Conclusion

62. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

63. Chen et al (US Patent 7,082,338) teaches a method for providing a process model for a material in a manufacturing process including the steps of receiving stress and distortion information of the material from a previous manufacturing process, determining updated stress and distortion information of the material from a process

model for the present manufacturing process and providing the updated stress and distortion information of the material to a subsequent manufacturing process.

64. Nagetgaal et al (US Patent 6,697,770) teaches evaluating the structural integrity of a structure through the use of a finite element model.

65. Shebini (US Patent 4,858,146) teaches the modeling of a structure using a finite element model, and includes finite element loads such as temperatures and strain.

66. Miller, Jacob ("Inter-Active Graphic Methods For Automating Mechanical Engineering Design and Analyses", Proceedings of the 17th Conference on Design Automation, pages 114-128, 1980), teaches structural modeling and analysis methods through finite element modeling and interactive CAD systems.

67. Knapp et al ("Finite Element Stress Analysis of Cables", OCEANS '99 MT S/IEEE, Riding the Crest Into the 21st Century, Vol. 2, pages 1026-1033, September, 1999), teaches accessing the structural integrity of cables using finite element modeling.

68. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mary C. Jacob whose telephone number is 571-272-6249. The examiner can normally be reached on M-F 7AM-5PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Paul Rodriguez can be reached on 571-272-3753. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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Examiner
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12/18/06

12/19/06
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